

# CLAIMS

Sub 91  
5 1. An inflatable liner for use in a protective helmet comprising  
an inflatable seamless body defining a multiplicity of internally disposed cells with each cell being separated from an adjacent cell by a constriction having a smaller internal cross-sectional area than said cells, said cells and constrictions forming a continuous passageway for the passage of air throughout said body;  
said body further defining  
a centrally disposed crown portion in the form of a ring of said cells and constrictions that is adapted to be positioned against and protect the top portion of the wearer's skull,  
15 a rear group of said cells and constrictions extending outward from said ring and adapted to be positioned against and protect the lower portion of the wearer's skull,  
a pair of side groups of said cell and constrictions extending outward from opposite sides of said ring and adapted to  
20 be positioned against and protect the side of the wearer's skull,  
and

5 a front group of said cells and constrictions extending  
out from said ring and adapted to be positioned against and protect  
the top front portion of the wearer's skull, said body having a  
first side that is substantially flat thereby facilitating the  
positioning of the said first side against the internal surface  
structure of the helmet; and

10 a valve connected to said body for permitting said body to be  
inflated and deflated with air whereby said body when inflated to  
a desired pressure is adapted to be inserted into a helmet with the  
flat surface juxtaposed against the inside surface structure of the  
helmet.

15 2. The inflatable liner of claim 1 in which said valve is  
positioned on a valve cell that extends inwardly from said ring  
into an opening defined by the ring, said valve cell having a  
larger volume than the other cells and further being sealed about  
an aperture to minimize ballooning of the valve

20 3. The inflatable liner of claim 1 in which said body has a  
second side that is curved and adapted to be in contact with the  
head of the wearer thereby fixing said helmet relative to said

wearer's head and permitting atmospheric air to circulate between areas of contact between said curved surfaces and the wearer.

4. The inflatable liner of claim 1 in which said front, rear, and side groups of cells, respectively form loops of said cells extending outwardly from said central ring of said cells.

5. A protective helmet for the protection of a wearer engaged in athletic events comprising

a rigid shell;

a layer of material attached to said shell for attenuating a portion of translational forces associated with impacts;

a plurality of pads attached to said layer and forming a first predetermined configuration defining open areas;

an inflatable seamless body defining a multiplicity of internally disposed cells with each cell being separated from an adjacent cell by a constriction having a smaller internal cross-sectional area than said cells, said cells and constrictions forming a continuous passageway for the passage of air throughout said body, said body having a second configuration such that, when said body is positioned in said open areas defined by said

plurality of pads, a periphery of said body abutting said pads with friction sufficient to maintain said body within said area.

5 *Sub 62* 6. The protective helmet of claim 5 in which said body further defining a centrally disposed crown portion in the form of a ring of said cells and constrictions that is adapted to be positioned against and protect the top portion of the wearer's skull, a rear group of said cells and constrictions extending outward from said ring and adapted to be positioned against and protect the lower portion of the wearer's skull, a pair of side groups of said cell and constrictions extending outward from opposite sides of said ring and adapted to be positioned against and protect the side of the wearer's skull, and a front group of said cells and constrictions extending out from said ring and adapted to be positioned against and protect the top front portion of the wearer's skull, said body having a first side that is substantially flat thereby facilitating the positioning of the said first side against the internal surface structure of the helmet; and a valve connected to said body for permitting said body to be inflated and deflated with air whereby said body when inflated to a desired pressure is adapted to be inserted into a helmet with the

flat surface juxtaposed against the inside surface structure of the helmet.

7. The inflatable liner of claim 6 in which said front, rear, and side groups of cells, respectively form loops of said cells extending outwardly from said central ring of said cells.

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10 8. The protective helmet of claim 6 in which said plurality of pads have portions of the surfaces thereof which are raised and said rear, front and side loops have rounded surfaces adapted thereby collectively forming a co-extensive surface adapted to abut against the wearer's skull and forming spaces for the circulation of air.

15 9. A method for making a helmet with an inflatable and removable liner comprising the steps of:

forming a helmet shell with an internal surface adapted to fit on the skull of a wearer;

20 forming padding having a first predetermined configuration and periphery;

attaching said padding to said helmet adjacent said internal surface of said helmet shell; and

molding a hollow flexible inflatable liner having a plurality of cells separated by constrictions, said liner having a second predetermined configuration and periphery that permits said liner to be molded essentially flat and thereafter folded and positioned within said shell in frictional and abutting engagement with the periphery of said padding.

10. The method of claim 9 in which said liner is molded into a centrally disposed crown portion in the form of a ring of said cells and constrictions that is adapted to be positioned against and protect the top portion of the wearer's skull, a rear group of said cells and constrictions extending outward from said ring and adapted to be positioned against and protect the lower portion of a wearer's skull, a pair of side groups of said cell and constrictions extending outward from opposite sides of said ring and adapted to be positioned against and protect the side of the wearer's skull, and a front group of said cells and constrictions extending out from said ring and adapted to be positioned against and protect the top front portion of the wearer's skull, said body having a first side that is substantially flat thereby facilitating the positioning of the said first side against the internal surface structure of the helmet.